LAWRENCE LIVERMORE
REPORT

A weekly review of scientific and technological achievements from Lawrence Livermore National Laboratory, Oct. 25-Oct. 29, 2010

Lab science booth draws thousands

The Lab's Kwei-Yu Chu shows visitors the climate simulation at the Lab's booth at the USA Science and Engineering Festival in Washington D.C.

From children and parents getting their first understanding of fusion ignition, to students and educators looking for ways to meet the planet's energy needs -- the Lab's booth proved to be a popular spot at the inaugural USA Science & Engineering Festival last weekend in Washington D.C.

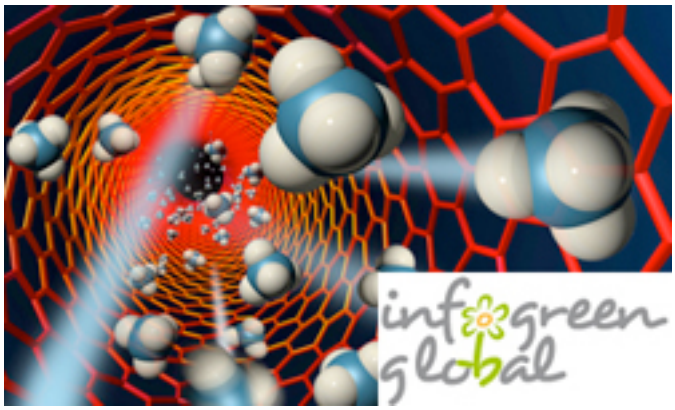
More than 10,000 visitors stopped by the Lab's exhibit, during the two-day expo on the National Mall.

The Laboratory featured an energy theme -- a 3D ride-along that takes visitors barnstorming through the National Ignition Facility and the quest for fusion ignition, and a climate simulation that challenges participants to meet 21st century energy needs while keeping carbon emissions to a minimum.

The Lab's exhibit was often crowded with science festival visitors four or five deep waiting to get to the Lab's simulations.

To read more, go to the Web.

Carbon nanotubes gain momentum



Researchers in carbon nanotubes, originally developed at the Laboratory, have been awarded more than $100,000 by the California Energy Commission to apply the technology to curbing industrial pollution.

Hayward-based Porifera, Inc., headed by former Lab scientist Olgica Bakajin, was awarded $115,397 for a project to research and develop carbon nanotube membranes to efficiently separate carbon dioxide from industrial emissions.

The goal of the project is to replace the chemical-based carbon dioxide separation technology with membrane-based technology. Carbon nanotube membranes are comprised of extremely small (about 10,000 times smaller than a human hair) and strong hollow tubes made of graphite carbon atoms. Gas flows through these tubes 100 times faster than the pores in other types of membranes.

If successful, carbon nanotube membranes could potentially deliver better efficiency, lower energy consumption, and provide cheaper carbon dioxide sequestration than the current process. The research team for the project includes scientists and engineers from Porifera, Lawrence Livermore and the University of California at Berkeley.

To read more, go to the Web.

On the road to New Orleans

There is a place once a year where the high performance community convenes. Some call it the mecca of supercomputers, called SC10. The Beowulf Bash is part of this year's SC10, the first of which was an attempt to invite the small fledgling cluster community at SC to gather in one room.

By creating an high performance computing (HPC) community, Beowulf Bash participants play an important role in the open source movement by having common goals and common ownership of ideas. Conversations are the life blood of any community and the Internet has made global HPC communities a reality.

To read more, go to the Web.

Setting sail toward the island of stability

Researchers searching for the elusive "island of stability" may have a better map.

With the recent discovery of six new variations of the superheavy elements on the bottom rung of the periodic table, scientists are closer to creating elements that are expected to last long enough for in-depth study.

LLNL's Darren Bleuel and Mathis Wiedeking are part of the 20-member team including scientists from Lawrence Berkeley Lab, UC Berkeley, Germany's GSI Helmholtz Center for Heavy Ion

Research, Oregon State University and Norway's Institute for Energy Technology. The team discovered six isotopes, never seen before, of the superheavy elements 104 through 114.

The team saw the isotopes of rutherfordium, seaborgium, hassium, darmstadtium, and copernicium by watching the decay of the yet-to-be-named element 114, a synthetic element first produced about a decade ago. Each isotope of an element differs in the number of neutrons in its nucleus, a variable that can affect radioactivity and other properties.

The nuclear chemists created a sample of element 114 by bombarding a plutonium target with a beam of calcium ions. As the handful of atoms began to decay -- a process that takes less than a tenth of a second -- the team saw six previously undiscovered isotopes of other heavy elements.

To read more, go to the Web.

Photo of the week:

Do you see what I see? LLNL's Karis McFarlane prepares an isotope sample by turning it into graphite. The sample then runs through the accelerator at the Lab's Center for Accelerator Mass Spectrometry (CAMS).

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particular expertise in high-energy-density physics, laser science, high-performance computing and science/engineering at the nanometer/subpicosecond scale, LLNL innovations improve security, meet energy and environmental needs and strengthen U.S. economic competitiveness. The Laboratory also partners with other research institutions, universities and industry to bring the full weight of the nation's science and technology community to bear on solving problems of national importance.

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